Commonwealth of Kentucky
Division for Air Quality

PERMIT APPLICATION SUMMARY FORM

Completed by: Ralph Gosney, P.E.

GENERAL INFORMATION:

Name:	Celanese, Ltd.
Address:	408 North Main Street Calvert City, KY 42029
Date application received:	9/30/2002
SIC/Source description:	2821, Plastics Materials, Synthetic and Resins, and Nonvulcanizable Elastomers
Source ID:	21-157-00055
Source A.I. #:	40292
Activity ID:	APE20040001
Permit:	V-05-076

APPLICATION TYPE/PERMIT ACTIVITY:

[X] Initial issuance	[ ] General permit
[ ] Permit modification	[ ] Conditional major
__Administrative	[X] Title V
__Minor	[X] Synthetic minor
__Significant	[ ] Operating
[ ] Permit renewal	[X] Construction/operating

COMPLIANCE SUMMARY:

[ ] Source is out of compliance [ ] Compliance schedule included

[X] Compliance certification signed

APPLICABLE REQUIREMENTS LIST:

[ ] NSR	[X] NSPS	[X] SIP
[ ] PSD	[X] NESHAPS	[ ] Other
[ ] Netted out of PSD/NSR	[X] Not major modification per 401 KAR 51:001, 1(116)(b)	

MISCELLANEOUS:

[ ] Acid rain source

[ ] Source subject to 112(r)

[ ] Source applied for federally enforceable emissions cap

[X] Source provided terms for alternative operating scenarios

[X] Source subject to a MACT standard

[ ] Source requested case-by-case 112(g) or (j) determination

[ ] Application proposes new control technology

[X] Certified by responsible official

[X] Diagrams or drawings included

[X] Confidential business information (CBI) submitted in application

[ ] Pollution Prevention Measures

[ ] Area is non-attainment (list pollutants):

EMISSIONS SUMMARY:

Pollutant	Actual (tpy)	Potential (tpy)
PM/PM_{10}	2.4	5.7
SO_2	0.0013	.0023
NOx	0.21	269.2
CO	4.2	1468.5
VOC	1158.5	2398.7
Acetaldehyde	3.3	7.3
Methanol	130.1	2278.6
Vinyl Acetate	32.8	94.1
Source wide HAPs	166.1	2379.9

1. Actual emissions are from the Kentucky Division for Air Quality's 2005 Emissions Inventory report.

SOURCE DESCRIPTION:

Celanese, Ltd.'s Calvert City operations are a synthetic organic chemical manufacturing industry (SOCMI). Celanese purchased the Calvert City Polyvinyl Alcohol plant from Air Products and Chemicals, Inc. on September 29, 2000. The source produces polyvinyl alcohol (PVOH) using vinyl acetate, methanol, sodium hydroxide, and a peroxide catalyst. Acetic acid is produced as a byproduct. The PVOH plant is divided into the following areas:

i. Polymerization (Poly): Vinyl acetate monomer (VAM) is continuously polymerized to polyvinyl acetate (PVAc). The reaction uses methanol and organic peroxide.
ii. Saponification (SAP): Following polymerization, the PVAc in methanol is hydrolyzed to dry polyvinyl alcohol (PVOH) using sodium hydroxide as a catalyst.
iii. Polyrectification: VAM and methanol from the Polymerization area are separated to recover and recycle VAM and methanol.
iv. Wedco: PVOH from the SAP Area is dry grinded into the final PVOH product.
v. Acetic Acid Recovery (AAR): The mother liquor (mixture of methanol and methyl acetate) from the SAP area is processed to extract and recycle the methanol. Methyl acetate is converted to acetic acid and methanol in ion exchange beds. The methanol from this reaction is also recovered and recycled. The acetic acid is de-watered and sent out as final product.
vi. Flare: The flare currently controls organic compound emissions from the Polyrectification and AAR Areas. The source plans to utilize the flare to control organic compound emissions from the Poly Area.
vii. Tank Farm: The area consists of 20 tanks that hold the raw materials and intermediate process streams.
viii. Loading Area: Materials are shipped and received by truck and railcar.

EMISSIONS AND OPERATING CAPS DESCRIPTIONS:

This source has elected to accept the following annual limits in order to preclude the applicability of 401 KAR 51:017, *Prevention of Significant Deterioration of Air Quality* (PSD) for volatile organic compounds (VOC) and for particulate matter (PM):

(a) The total emissions of volatile organic compounds (VOC) from the summation of emissions from EP F01(11-), F01(12-), F01(13-), F01(14-), F01(15-), P02, P05, P08, S01, S02, W01, W04, W07, W14-W25, W29, F01(2A), F01(3A), F01(5A), F01(9A), F01(10A), A07, A08, R04, F01(18-), T05, T06, T07, T08, T09, F01(19-) and T11 shall not exceed 248 tons per consecutive twelve (12) month period. [Permit No. S-95-198R, issued on June 4, 1998, Permit No. S-97-054, issued on May 20, 1997, Permit No. C-86-172, issued on August 8, 1986, and Permit No. C-84-146, issued on August 21, 1984]

(b) The total VOC emissions from EP S01 and S02 shall not exceed 37.67 tons per consecutive twelve (12) month period. [Permit No. O-87-015, Condition 18, issued on March 27, 1987]

(c) The total emissions of particulate matter (PM) from the summation of emissions from EP W01, W04, W07, W11, W14-W25, W26-W28, S04, S08, S12 and S16 shall not exceed 27 tons per consecutive twelve (12) month period. [Permit No. C-84-146 issued on August 21, 1984]

The permittee shall also comply with the following operating limitations.

(a) The loading rates of polyvinyl alcohol (PVOH) shall not exceed the following limitations: [VF-03-001, issued on September 5, 2003]
   i. EP W29: 75,000 tons per twelve (12) consecutive month basis
   ii. EP W33: 5,000 tons per twelve (12) consecutive month basis
   iii. EP W34: 63,022 tons per twelve (12) consecutive month basis
   iv. EP W37: 75,000 tons per twelve (12) consecutive month basis
   v. EP W38: 75,000 tons per twelve (12) consecutive month basis

(b) The production rates shall not exceed the following limitations: [Permit No. S-95-198R, issued on June 4, 1998 and Permit No. C-86-172, issued on August 8, 1986]
   i. F01(3A): 85,000 lbs/hr and 372,300 tons per twelve (12) consecutive month basis
   ii. F01(9A): 55,420 lbs/hr and 242,748 tons per twelve (12) consecutive month basis
   iii. F01(10A): 55,260 lbs/hr and 242,039 tons per twelve (12) consecutive month basis

(c) The production rates shall not exceed the following limitations, determined on a twelve (12) consecutive month basis: [Permit No. S-95-198R, issued on June 4, 1998]
   i. F01(2A): 53,000 lbs/hr
   ii. F01(4A): 120,000 lbs/hr
   iii. F01(5A): 100,000 lbs/hr
   iv. F01(7A): 31,600 lbs/hr

OPERATIONAL FLEXIBILITY:

For the occurrences of start-ups at EP P01, P03, P06, S02(A1), S02(B1), S02(C1), S02(D1), R01, R02 or R03, the permittee shall follow the Startup, Shutdown, and Malfunction Plan requirements of 40 CFR 63 Subparts A and FFFF.

For the occurrences of start-ups at EP A01, A02, A03, A04, A05 or A06, the permittee shall follow the Startup, Shutdown, and Malfunction Plan requirements of 40 CFR 63 Subparts A, F, G and H.

For the pipeline equipment in the Polymerization, Polyrectification, SAP, Tank Farm, and Loading Areas, subject to 40 CFR 63.2480(a) and Table 6 to Subpart FFFF, the permittee may comply with

the requirements in Subpart UU of 40 CFR 63 and the requirements referenced therein, except as specified in §63.2480(b) and (d); Subpart H of 40 CFR 63 and the requirements referenced therein, except as specified in §63.2480(b) and (d); or 40 CFR 65, subpart F and the requirements referenced therein, except as specified in §63.2480(c) and (d).